

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
13 October 2005 (13.10.2005)

PCT

(10) International Publication Number
WO 2005/096540 A1

(51) International Patent Classification⁷: **H04L 9/00**

01862 (US). LAGASSE, Michael, J. [US/US]; 6 Nautical Lane, Nahant, MA 01908 (US).

(21) International Application Number:
PCT/US2005/006909

(74) Agent: GORTYCH, Joseph, E.; Opitcus IP, 7791 Alister Mackenzie Drive, Sarasota, FL 34240 (US).

(22) International Filing Date: 3 March 2005 (03.03.2005)

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/554,687 19 March 2004 (19.03.2004) US

(71) Applicant (for all designated States except US): **MAGIC TECHNOLOGIES, INC.** [US/US]; 171 Madison Avenue, Suite 1300, New York, NY 10016-5110 (US).

(71) Applicant and

(72) Inventor (for all designated States except US): **YOUNG, Jonathan** [US/US]; 145 State Street, Newburyport, MA 01950 (US).

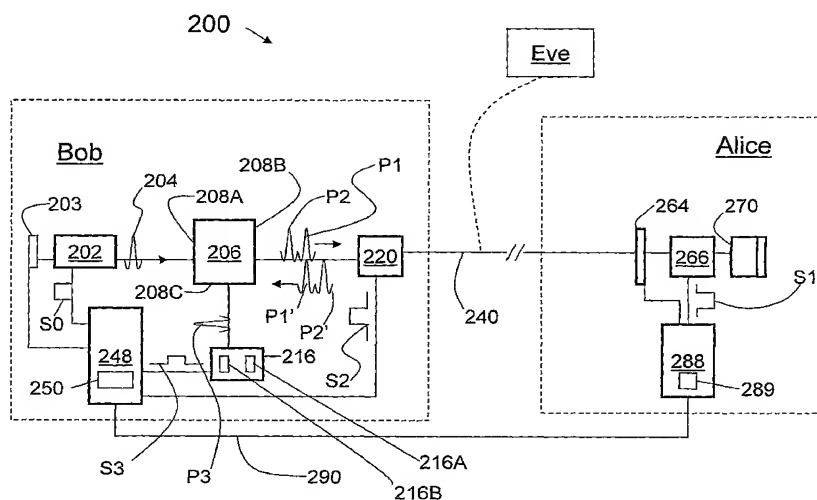
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **VIG, Harry** [CA/US]; 8 Kohlrausch Avenue, North Billerica, MA

[Continued on next page]

(54) Title: AUTOCALIBRATION FOR QKD SYSTEMS



(57) Abstract: A method of autocalibrating a quantum key distribution (QKD) system (200) is disclosed. The QKD system includes a laser ((202) that generates photon signals in response to a laser gating signal (S0) from a controller (248). The method includes first performing a laser gate scan (304) to establish the optimum arrival time (T_{MAX}) of the laser gating signal corresponding to an optimum- e.g., a maximum number of photon counts (N_{MAX})-- from a single-photon detector (SPD) unit (216) in the QKD system when exchanging photon signals between encoding stations (Alice and Bob) of the QKD system. Once the optimal laser gating signal arrival time (T_{MAX}) is determined, the laser gate scan is terminated and a laser gate dither process (308) is initiated. The laser dither involves varying the arrival time (T) of the laser gating signal around the optimum value of the arrival time T_{MAX} . The laser gate dither provides minor adjustments to the laser gating signal arrival time to ensure that the SPD unit produces an optimum (e.g., maximum) number of photon counts.

WO 2005/096540 A1

**Declaration under Rule 4.17:**

— *of inventorship (Rule 4.17(iv)) for US only*

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.